

The Superior Oil Company
Piceance Creek Core Hole #6
Sec. 14-1N-97W
Rio Blanco County, COLORADO

SAMPLE DESCRIPTION

<u>Depth</u>	<u>Description</u>
<u>Core No. 1 70' to 74' Cut: 4 Rec: 4 Boxes: 2</u>	
70-74	Sandstone, lt gry brn to buff, calc, dense, very fine gr., granular, subangular, top 2' oxidized - less organic fragments lower 2', higher content of organic fragments - random orientation, no distinctive odor, massively bd.
<u>Core No. 2 74' to 90' Cut: 20 Rec: 20 Boxes: 7</u>	
74-90	Sandstone, lt gry to buff, calc, well indurated, very fine gr., granular, subangular, bottom 1' oxidized, organic trash throughout, no odor, massively bd.
<u>Core No. 3 90' to 99' Cut: 9 Rec: 9 Boxes: 3</u>	
90-99	Sandstone, lt gry, calc, well indurated, very fine gr., granular, subangular, little organic material, very lean marlstone with pyrite loops present at 98.7 to 99, slt. kerogen odor in this $\frac{1}{2}$ '
<u>Core No. 4 99' to 111' Cut: 12 Rec: 11 Boxes: 4</u>	
99-104	Siltstone, lt gry to lt brn, slt. calc, very dense, poorly bd, little organic material
104-110	Sandstone, lt gry slt. calc, dense, poorly bd, extremely fine gr, granular, badly broken 107, little organic material
110-111	Missing
<u>Core No. 5 111' to 126' Cut: 15 Rec: 15 Boxes: 5</u>	
111-126	Siltstone, lt br, hd, non-calc, poorly lamin, almost massive, little or no organic matter, lg. vert fract 118, 124-126.

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<u>Core No. 6 126' to 136' Cut: 10 Rec: 10 Boxes: 4</u>	
126-136	Siltstone, lt brn, very hd., calc except for upper two ft. poorly laminated, organic matter present (not in high amt) solid core, vert. fractures in top 1' 127' & 130', thickly bd. while silt layers
<u>Core No. 7 136' to 153' Cut: 17 Rec: 16 Boxes: 6</u>	
136-143	Siltstone, lt gry to buff, calc, well indurated, poorly bd, almost massive, little to no organic material, 141' & 142' have 2' & 3" resp. ss layers
143-150	Marlstone, dk gry to brn, calc, well indurated, poorly to finely laminated, organic content higher, kerogen content weak, badly broken 149'
150-151	Missing
151-153	Marlstone, same as 143'-150', badly broken 151-152
<u>Core No. 8 153' to 183' Cut: 30 Rec: 29 Boxes: 10</u>	
153-157	Marlstone, lt brn, slt calc, very dense, finely laminated, slight kerogen odor, lower organic content
157-182	Siltstone, lt gry to lt buff, non calc except for bottom 1', very dense, finely to poorly bd, 2"-8" marlstone stringers at 170'-177½'-179', ostracods (I.D. under microscope) are present in the basal 1' of core
<u>Core No. 9 183' to 211' Cut: 28 Rec: 28 Boxes: 10</u>	
183-211	Marlstone, brn to dk brn, top is a good marlstone (Note: some question from core #8 bottom (tuff??) calc, well indurated, finely laminated, 183-208 high organic content, 208-211 marlstone lower organic matter & high silt content, loop structures throughout 183-211, high angle frac 185', kerogen odor weak to med.

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<u>Core No. 10 211' to 241' Cut: 30 Rec: 30 Boxes: 10</u>	
211-212	Marlstone, dk br, hd, non calc, slt kerogen
212-241	Siltstone, lt-dk br, <u>y</u> hrd, non calc, many small dk laminae but not a marlstone, no kerogen, trace H ₂ S, v silty & partially leached 236-238 w/many small holes
<u>Core No. 11 241' to 271' Cut: 30 Rec: 30 Boxes: 10</u>	
241-262	Siltstone, lt br, hd, non calc, poorly lamin, fract. 241-244, 259-261 silty lenses and partially leached 243-244, 251-254, 258-259
262-264	Marlstone, dk br, hd, non calc, organ. rich, no kerogen
264-271	Marlstone, lt-dk br, hd, non calc, v. silty w/thin lenses of siltstone, fract 267-268
<u>Core No. 12 271' to 300' Cut: 29 Rec: 29 Boxes: 10</u>	
271-273	Marlstone, lt brn, hd, non calc, very silty, 271 broken
* 273-300	Siltstone, lt buff to gry, well indurated, slt. calc, poorly bd, marlstone 280-283, very lean, poorly bd, lean, sand lense (fine gr) 281-82, silt fracture throughout with secondary quartz & Nah (or calcite) filling the fractures, fractures & filling give portions of the core a brecciated look
<u>Core No. 13 300' to 316' Cut: 16 Rec: 16 Boxes: 6</u>	
300-316	Siltstone, lt gry, very dense, well indurated, slt. calc, poorly bd, badly broken 300-302, 306-308, 312-314, fractures throughout with brecciated effect, filling druse quartz and a small amt of Nah.

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Core No. 14 316' to 332' Cut: 16 Rec: 14 Boxes: 5

316-330 Siltstone, lt gry, very dense, well indurated, slt. calc, poorly bd, badly broken 318-319, 325-330; 316' to 321' badly fractured & filled with quartz & possibly Nah., pyrite present 321-325, no distinctive odor

330-332 Missing

Core No. 15 331' to 359' Cut: 27 Rec: 27 Boxes: 9

332-336 Siltstone, gry, slt calc, well indurated, contorted bd (esp. 334.5) no recognizable organic matter or odor

336-356 Marlstone (only on higher organic matter and slt more clay lt brn to brn, slt calc) some places non calc, very dense, finely laminated, (wetting only shows bd & organic matter), some contortion such as at 342 & 352, organic high at 338'-340.5' (good marlstone) but lesser in the rest of the core, esp. toward the bottom?? Plant remains on bd planes??

356-359 Siltstone, buff, calc, very hd, poorly bd, somewhat contorted, leached - small vugs present with no filling, brecciated at 358½', no odor

Core No. 16 359' to 379' Cut: 20 Rec: 19 Boxes: 7

359-377 Siltstone, brn, calc, well indurated, finely bd, (marlstone at 367½-370½) badly broken 359-361, organic matter low throughout core, leached vugs at 360½-361, no filling, kerogen odor strong at 368'

377-378 Missing - cavity zone - water production went from 20 gpm to 45 gpm here.

378-379 Silstone - same as 359-377

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Core No. 17 379' to 409' Cut: 30 Rec: 29 Boxes: 10

379-409 Siltstone, lt gry-brn to brn, calc, very dense, some contorting in the thinly bd silt, 1½" sand lense at 392', material has been leached therefore lower organic material, higher silt, Leached Nah vugs at 380'-381' (2" diameter), at 387-388 (3" diam), 390-391 (6" leached zone Nah still present 406-407 (2" & 2" layer) 383 good marlstone, med. kerogen odor, high angle fract at 403-405, 405-406 missing

Core No. 18 409' to 425' Cut: 16 Rec: 15 Boxes: 5

409-412 Marlstone, dk brn, slt calc, finely laminated, well indurated, slight kerogen odor

412-413 Siltstone, lt gry to med brn, hard, non calc, finely laminated

413-418 Marlstone, dk brn, non calc, hard, finely laminated, numerous silt lenses in the bottom 3', slt. kerogen,

418-425 Siltstone, med brn, non calc 418-420, 420-425 calc, hard, finely bd, no vugs 418-420, 420-425, leached vugs with some Nah present (very small amt) 50% of this portion has leached vugs, slt. kerogen odor, 422-423 missing - driller dropped through a large vug at this point

Core No. 19 425' to 434' Cut: 9 Rec: 7 Boxes: 3

425-434 Marlstone, lt-dk br, hd, non-calc, finely lamin, 430-431½ v. silty, v. fractured 425½, 427-429, 432-434, missing 427-428 and 433-434, no to slt. kerogen odor

Core No. 20 434' to 440' Cut: 6 Rec: 6 Boxes: 2

434-440 Marlstone, lt brn to brn, non calc, well indurated, finely laminated and contorted, silt lenses 434-35', kerogen odor low, organic content med.

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Core No. 21 440' to 448' Cut: 8 Rec: 8 Boxes: 3

440-440½ Marlstone, dk br, hd, non calc, finely lamin,
low kerogen

440½-448 Siltstone, lt gr-lt br, hard, non-calc, evenly
bedded, near vert. fract 441, 444-448

Core No. 22 448' to 455' Cut: 7 Rec: 7 Boxes: 2

448-455 Siltstone, lt br, hd, non calc, poorly bedded
with some contortions becoming more marly
toward the bottom, no kerogen

Core No. 23 455' to 485' Cut: 30 Rec: 29 Boxes: 10

455-485 Siltstone, lt gry to brn (dk), non calc, well
indurated, poorly bd, and contorted such as
at 461-463, very dense at 467 (almost a chert)
marlstone at 455-456, 477-478½, leached Nah
vugs at 471.8, 475.4, (2" diam. very broken)
Nah. present at 466.8' (4" thick), badly broken
at 467-68, 470-472, 475, 479, kerogen odor in
marlstones & silt lenses low.

Core No. 24 485' to 513' Cut: 28 Rec: 26 Boxes: 9

485-511 Siltstone, lt gry to brn, non calc, well
indurated, poorly to med. bd, little contortion,
little organic material except at 487.8 to
488.8' - 509.5 to 511'- marlstone (weak kerogen
odor) leached vugs at 510', high fractures at
499 to 504 & 505 to 509 (pyrite xtals on frac-
ture surface) badly broken at 487, 492, 504,
511

511-513 Missing

Core No. 25 513' to 543' Cut: 30 Rec: 30 Boxes: 10

513-543 Siltstone, lt-dk br, hd, non-calc, thin-med
bedded, little organic matter, numerous
silty lenses, vugs at 514, 518, 540-543,
slt. kerogen in bottom 8 ft.

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Core No. 26 543' to 573' Cut: 30 Rec: 27½ Boxes: 9

543-571 Siltstone, lt gry to dk brn, slt. calc, hard, poorly to finely bd, places deformed & contorted (546' & 550) leached vugs at 543.5 (2½ in), 546 (badly broken), 547.8 (broken) 553 (lense 1½" Nah present) vert. frac. 551-557, organic cont. low except for a marlstone at 543

571-573 Missing

Core No. 27 573' to 603' Cut: 30 Rec: 30 Boxes: 10

573-603 Siltstone, gry to brn, upper 5' non calc, rest calc, well indurated, poorly to finely bd, organic content low as well as kerogen odor, badly broken 575', 580', 591'-596', leached vugs 599' (1" dia) 580' (3" dia) 584-589 very coarse silt

Core No. 28 603' to 633' Cut: 30 Rec: 30 Boxes: 10

603-633 Siltstone, lt gry to very lt brn, slt calc top 6' rest non calc, finely bd, high angle fracture at 612-615, 622-630, at 615.4 to 616.4, dk gry siltstone, very fine gr, massively bd, water laden (good water) core low in kerogen odor

Core No. 29 633' to 649' Cut: 16 Rec: 16 Boxes: 5

633-649 Siltstone, lt-med br, hd, non calc, except 632-639, poorly bedded with slt. contortions slt. kerogen odor 633-635 and more marly, a 3" siltstone layer with H2O as in Core #28 at 637', vert. fract 638-641, broken 646-649

Core No. 30 649' to 679' Cut: 30 Rec: 16 Boxes: 10

649-679 Siltstone, dk gr-dk br., hd, non calc, evenly bedded 649-666, bedding becoming more contorted 666-679 with thicker gr silt lenses, slt. kerogen 649-652, 676-679

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Core No. 31 679' to 709' Cut: 30 Rec: 30 Boxes: 10

679-681	Siltstone, lt-dk br, hd, non calc, more organic and marly, good kerogen,
681-694	Siltstone, dk br, hd, non calc, not much dark organic but still slt kerogen 683-691 more porous, silty and bleeding asphaltic material out small holes slt. calc in this section
694-707	Marlstone, lt-dk br, hd, non calc, top foot silty, still low in organic matter but has good kerogen odor 695-698 has some contortion, rest is finely bedded
707-709	Siltstone, lt br, hd, non calc, med. bedded becoming coarser-sandy at bottom, slt kerogen

Core No. 32 709' to 739' Cut: 30 Rec: 30 Boxes: 10

709-739	Marlstone, med. to dk brn, non calc, well indurated, dense, finely laminated 710.5 to top, rest poorly to finely lamin (ss layer (4") at 735.6) organic content high esp. at 723.3 & 724, kerogen odor med. to strong, silt content high
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Core No. 33 739' to 795' Cut: 56 Rec: 56 Boxes: 8

739-795	Marlstone, dk brn, non calc, finely laminated, fractured vert. at 745.8-748, 766.7-770, Nah vugs at 757-766, 40% of this portion is Nah in 2"-4" vugs & 2-4" layers 769.8 to 785, some Nah present in small vugs - most of these are deeply leached, (the fracture system may present an avenue for water leaching) kerogen odor is med to strong - silt content still high in some zones,
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Core No. 34 795' to 855' Cut: 60 Rec: 60 Boxes: 20

795-855	Marlstone, dk brn to 814', lt chocolate brn 814 to 855, non calc, well indurated (very hd) poorly to finely laminated 817-855, high contorted esp. near the numerous silt lenses, no vugs, high angle fractures 800', 808-810', 843-844 (filled) organic content high 795-814, lower 814'-855', kerogen odor high throughout core
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Core No. 35 855' to 915' Cut: 60 Rec: 60 Boxes: 20

855-915 Marlstone, md gry to dk brn, non calc, well indurated (dense), very finely laminated by containing high silt content. Organic material low, high angle fract. 855-56, 866-67, 882-885, (organic matter deposited on fracture surface) no vugs, chalcedony in fracture 886.8', kerogen odor high throughout core

Core No. 36 915' to 975' Cut: 60 Rec: 60 Boxes: 20

915-931 Marlstone, med to dk brn, non calc, very hard, well indurated, med. laminated, micaceous in upper 4' organic content high, kerogen odor high, bottom of lower oil shale

931-975 Shale, dk brn to blk, non calc, well indurated, fractures, no fissile nature to the adding, some very small silt lenses throughout the core. Sheen off typical Gard. Gulch present but not with a high luster. Kerogen odor high throughout the core, very marly throughout core.

Core No. 37 975' to 1035' Cut: 60 Rec: 60 Boxes: 20

975-981 Marlstone, lt-dk br, hd, non calc, distorted bedding, med kerogen, shaley

981-984 Shale, dk br-blk, hd, non calc, fissile, few small siltstone lenses

984-998 Marlstone, dk br, hd, poorly bedded and distorted, very shaley

998-1035 Marlstone, lt-dk br, finely-poorly bedded non calc, numerous thin-med. siltstone lenses with silt, nodules in the poorly bedded sections, bottom 9' becoming very silty but still a good marlstone, good kerogen odor throughout

Core No. 38 1035' to 1094½' Cut: 59½ Rec: 59 Boxes: 10

1035-1047 Marlstone, lt br, hd, non calc, fine-med. bedded, v. silty, vert. cement frac 1035-1037 ostracodal & molluscan fauna in ss lens 1038, good kerogen

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<u>Depth</u>	<u>Description</u>
1047-1058	Marlstone, lt br, hd, non calc, poorly-non bedded, numerous silt lenses & nodules, good kerogen, still v. silty
1058-1094½	Marlstone, lt-dk br, hd, non calc, mainly silty with fine-med. bding and some contortion, more darker units 1070-1074, 1085-1089, 1093-1094 these areas more shaley, thick siltstone lens 1074, good kerogen

Core No. 39 1094½' to 1125' Cut: 30½ Rec: 30½ Boxes: 10

1094½-1123	Marlstone, lt brn to brn, non calc, well indurated hd, poorly to med laminated, getting shaley at 1111' to bottom, poker chip break 1121-1123', top portion v. silty, kerogen odor v. strong, some organic fragments at 1117.5'
1123-1125	Shale, dk brn to blk, non calc, poorly indurated, bdding is hd to distinguish, poker chip breaking along bd. planes, sheen present throughout this portion, badly broken 1124-25, kerogen odor high throughout

Core No. 40 1125 to 1182' Cut: 57 Rec: 57 Boxes: 19

1125-1127	Shale, dk gry to blk, non calc, poorly indurated, bd difficult to distinguish, badly broken, kerogen odor med.
1127-1148	Marlstone, gry brn to dk brn, non calc, well indurated, thinly bdd contorted 1144-46, aragonite stringers 1141.2-1142.2'
1148-1152	Shale
1152-1165	Marlstone, high shale content
1165-1171	Shale, mlst. stringer 1167'
1171-1174	Marlstone
1174-1182	Shale, with mrlst stringers

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Core No. 41 1182' to 1238' Cut: 57 Rec: 57 Boxes: 19

1182-1238 Shale, dk gry to blk, non calc, poorly to med. indurated, fissile, badly broken throughout core, conchoidal fracture on some surfaces. Contort. siltstone lenses all and 1227. Kerogen odor med to strong, organic residue in high angle fract. 1234-36.

Core No. 42 1238 to 1298 Cut: 60 Rec: 60 Boxes: 20

1238-1298 Shale, dk gry to blk-greenish cast, non calc, poorly to med. indurated, fissile, finely bd with 2-3" siltstone lenses at 1242, 43, 44.8, 50, 62-66, 89, 95.2, badly broken at 1264.5, 1260, sheen present on fracture surfaces, kerogen odor med. to strong

Core No. 43 1298 to 1330 Cut: 32 Rec: 32 Boxes: 11

1298-1330 Shale, dk gry to blk, non calc, poor to med. indurated, fissile, badly broken 1328-1330, silt lenses absent, fractured surfaces have sheen, kerogen odor med to strong

Core No. 44 1330 to 1365 Cut: 35 Rec: 35 Boxes: 12

1330-1365 Shale, dk gry-blk, non calc, fissile, easily broken, badly broken and vert. fract 1350, 1364, med kerogen odor

Core No. 45 1365 to 1393 Cut: 28 Rec: Boxes:

1365-1368.5 Shale, dk gry to blk, non calc, med to well indurated, silt marly, kerogen odor med.

1368.5-1384 Marlstone, gry to dk brn, non calc, well indurated, siltstone & ss lenses, 1370.2-1371.4, poorly to finely laminated, kerogen odor-med, silty

1384-1390 Sandstone, lt gry, silt calc, well indurated very irregular bdding, low organic content qtz grains subangular, no kerogen odor. silty

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1390-1393

Siltstone, lt gry to blk, non calc, hard,
very fine grained, dense, no organic content,
no kerogen odor